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Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the United Western
Mine (Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	United Western	Alternative names	J and M, Section 36, Lease 60-167, VCA mine
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
Latitude	35.25486	County	McKinley
Longitude	107.86624	TRS	T 14N, R 10W, Sec 36, NE, NE

Site physical description:

The United Western Mine Site ("Site") is located approximately 5.7 miles northwest of the junction of State highways 509 and 605 in the Ambrosia Lake – San Mateo Creek areas (Ref. 1). The Site is located in the Ambrosia Lake 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.25486, longitude 107.86624, and elevation approximately 6,981 ft above sea level. The total acreage of the Site is unknown but appears to be less than 10 acres. Access to the Site is by permission and a locked gate. Figure 1 is a Google Earth location map of the Site, and Figure 2 is location map on the Ambrosia Lake quadrangle map. Figures 1 and 2 are contained in Attachment A.

The United Western Mine is located on the immediate northwest boundary of the Rio Algom Mill (formerly Kerr McGee) which is in the final stages of decommissioning under the Nuclear Regulatory Commission (NRC). Very little is known about the Site, but during a tour of the Rio Algom Mill area on May 11, 2010, NMED staff drove past the Site and noticed that the shaft was covered and fenced off.

Site identification:

San Mateo Creek watershed, Bluewater Underground Basin. The Site is one of numerous legacy uranium sites within the Grants Mining District.

Site summary:

Very little is known about the Site. Apparently the shaft was started in 1954 and the mine was last active in the early 1960's (Ref. 2)

Targets:

The Site is located 1000 feet east of the Arroyo del Puerto where it bends northward at the northwest property boundary of the Rio Algom Mill Site. The Site appears to be located next to the Rio Algom Mill Site property boundary. The Site is located roughly one mile due west of Highway 509 along the northern section line boundary for Sections 32 and 31. The Arroyo del Puerto joins San Mateo Creek south of the junction between state highways 509 and 605. The San Mateo Creek alluvial system has the potential to be in hydraulic communication with bedrock aquifers.

If mine dewatering occurred during operation, it is likely that the water was discharged to the Arroyo del Puerto. The Site also has the potential to supply surface sediment or soil to Arroyo del Puerto during high precipitation runoff events. The Site is accessible by range cattle and animals, but human trespassers and inadvertent intruders would have to pass through or over locked gates to get on the Site. The hoist frame structure and various pieces of equipment could present physical hazards to humans.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 (Ref. 3).

Site ownership and Potential Responsible Parties:

The history of site ownership and potentially responsible parties for the Site is as follows. The site was leased through the New Mexico State Land Office to United Western Minerals Company of Santa Fe. The site was operated by the Vanadium Corporation of America from 1957 to 1958. From 1959-1960 the Site was operated by Jordan and Marshall of Grants, NM, under contract to Vanadium Corporation of America. The surface rights have since been acquired by Rio Algom Mining, LLC Mill (Ref. 2).

File review:

Files that were reviewed for this assessment are listed below.

Site reconnaissance:

In 1980 Anderson visited the Site, described several features, and collected radiological readings. Anderson observed a mine dump; a powder magazine, evidence of subsidence around the main shaft; and a small wood timber head frame (Ref. 4). The mine dump indicated 700-900 counts per second (42,000-56,000 cpm or 240-320 $\mu\text{R/hr}$). According to records from 1989, the shaft had been backfilled, buildings were removed, and equipment was salvaged. The Mine produced such a small volume of ore, it was categorized as an exempt quantity (<20,000 tons?).

In 2008, a contractor to the Mining and Minerals Division performed a field radiological survey (Ref. 5). Figure 3 presents a diagram of the Site and the field radiological survey locations. The surface readings ranged from 16-30 $\mu\text{R/hr}$ and averaged 20 $\mu\text{R/hr}$.

Recommendation:

A site visit is recommended to assess the potential for surface physical and radioactivity hazards and determine if threats to human health and the environment exist. In addition, follow up inquiry is necessary to determine if the mine is being addressed by Rio Algom Mining, LLC as part of the NRC permit area for the Rio Algom Mill.

The Site should be given consideration in the regional characterization of ground water potentially impacted by legacy uranium mining activities. A generalized investigation of potential alluvial ground water impacts from "wet" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Data from other former "wet" mines suggest that re-saturation of the ore-host Morrison Formation, following cessation of pumping for mine dewatering, may be causing mobilization of uranium and associated minerals, and consequent degradation of ground water quality, due to influx of oxygenated ground water. If this recommended, generalized investigation were to indicate a potential for alluvial and/or deep ground water impacts, on-Site or nearby installation of one or more monitor wells may be considered necessary at a future date.

References:

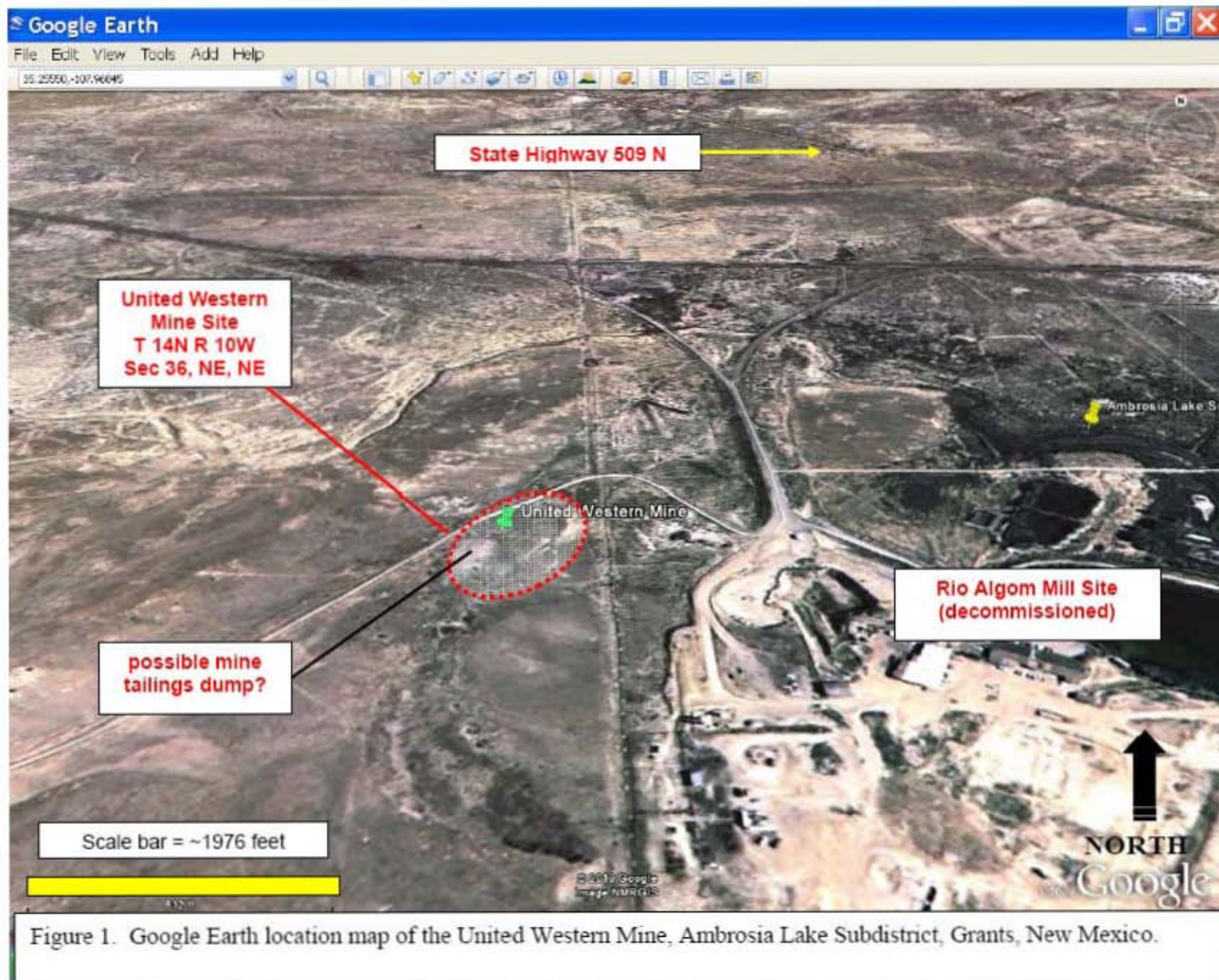
1. USGS, 1957. Ambrosia Lake, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
3. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
4. Anderson, Orin J., 1980. "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
5. Soder Miller Associates, Field data collected from NM Mining and Mineral Division, October 2008.

Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the United Western Mine Site, Grants Mining District, New Mexico.

distance from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE
0 - 0.25									
0.25 - 0.50									
0.50 - 0.75									
0.50 - 0.75	849	Bluewater	00539		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPT.	Public
0.50 - 0.75	895	Bluewater	00680		0.00	0.00	0.00	STAR LAKE RAILROAD CO.	Construction
0.50 - 0.75	186806	Bluewater	01145		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPARTMENT	Highway
0.75 - 1.0									
0.75 - 1.0	188190	Bluewater	00481	3/22/1984	28.00	4.00	4.00	KERR-MCGEE CORPORATION UNITED NUCLEAR-HOMESTAKE PTNRS	Monitoring
0.75 - 1.0	1285	Bluewater	00522	2/7/1978	70.00	0.00	0.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitoring
0.75 - 1.0	180648	Bluewater	00522	2/7/1978	70.00	0.00	5.00	PTNRS	Mining
0.75 - 1.0	378	Bluewater	00994	3/23/1968	810.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	97	Bluewater	00384	8/31/1958	735.00	0.00	6.00	ANDERSON DEVELOPMENT CORP.	Mining
1.0 - 2.0	785	Bluewater	00386	12/31/1955	780.00	0.00	4.50	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	183001	Bluewater	00371	8/25/1956	752.00	0.00	8.83	SABRE-PINON CORPORATION	Mining
1.0 - 2.0	188189	Bluewater	00481		0.00	0.00	0.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	188191	Bluewater	00481		800.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	188192	Bluewater	00481		1100.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	188193	Bluewater	00481		200.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	188194	Bluewater	00481		300.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	532	Bluewater	00994	9/18/1958	857.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	1170	Bluewater	00994	6/8/1958	750.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	823	Bluewater	00994	3/16/1970	779.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	620	Bluewater	00362	11/30/1956	3093.00	0.00	10.75	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	29	Bluewater	00363	4/30/1956	745.00	0.00	4.50	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	851	Bluewater	00365	1/31/1956	793.00	0.00	6.83	ANDERSON DEVELOPMENT CORP.	Mining
2.0 - 3.0	1490	Bluewater	00372	9/12/1956	796.00	0.00	8.83	SABRE-PINON CORPORATION	Mining
2.0 - 3.0	217	Bluewater	00375	1/2/1957	801.00	0.00	10.75	PHILLIPS PETROLEUM COMPANY	Industrial
2.0 - 3.0	1173	Bluewater	00376	2/7/1957	3366.00	0.00	16.00	UNITED NUCLEAR CORPOATION	Industrial
2.0 - 3.0	395	Bluewater	00994	1/9/1959	848.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	1428	Bluewater	00994	4/5/1959	1094.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	354	Bluewater	00373	12/31/1956	1003.00	0.00	13.38	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	1225	Bluewater	00994	1/2/1958	827.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	194382	Bluewater	01558	3/19/2004	800.00	860.00	5.00	GRIDER	Stock
	POD REC NBR: point of diversion record number.								
	POD BASIN: point of diversion basin								
	POD NBR: point of diversion number								

Attachment A

Figures 1, 2, and 3



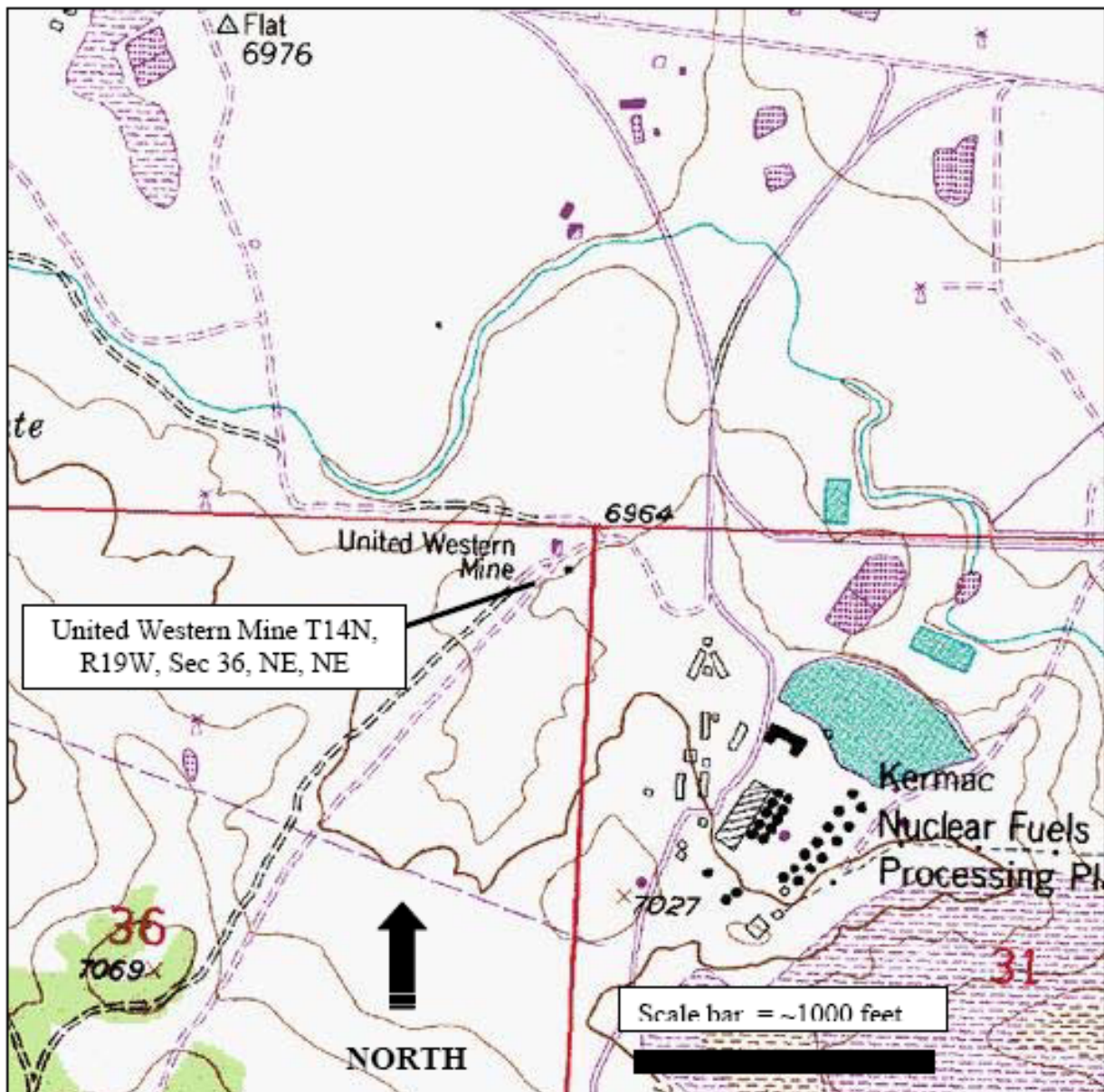


Figure 2. TopQuest.com location map of United Western Mine in the USGS topographic map Ambrosia Lake 7.5 minute quadrangle.



Figure 3. Aerial photograph map of the United Western Mine Site with radiological reading locations marked as red dots. Radiological readings averaged 20 $\mu\text{R/hr}$ at the surface, and ranged from 16 – 30 $\mu\text{R/hr}$.